

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis of Total Metals By EPA Method 200.8

James E. Blythe, Ph.D.  
 Charlene Morrow, M.S.  
 Yelena Aravkma, M.S.  
 Bradley T. Benson, B.S.  
 Kurt Johnson, B.S.  
 Date Received: 11/30/06  
 Date Extracted: 12/05/06  
 Date Analyzed: 12/05/06  
 Matrix: Water  
 Units: ug/L (ppb)

Client: Alaskan Copper Works  
 Project: % of acid, PO# M109207-F&B1-611339  
 Lab ID: 611339-01 10000x  
 Data File: 611339-01 10000x.014  
 Instrument: ICPMS1  
 Operator: btb

3012 16th Avenue West

Seattle, WA 98119-2029

TEL: (206) 285-8282

FAX: (206) 283-5044

e-mail: fbi@isomedia.com

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	90	60	125
Holmium	90	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	19,800,000
Nickel	17,900,000
Copper	2,810,000
Zinc	85,200
Arsenic	18,400
Silver	<10,000
Cadmium	<10,000
Lead	10,000
Iron (screen)	73,580,000

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID: M109207B Sm Tank  
Date Received: 11/30/06  
Date Extracted: 12/05/06  
Date Analyzed: 12/05/06  
Matrix: Water  
Units: ug/L (ppb)

Client: Alaskan Copper Works  
Project: % of acid, PO# M109207, F&BI 611339  
Lab ID: 611339-02 10000x  
Data File: 611339-02 10000x.015  
Instrument: ICPMS1  
Operator: btb

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	90	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	13,100,000
Nickel	27,900,000
Copper	27,400,000
Zinc	91,400
Arsenic	14,800
Silver	<10,000
Cadmium	<10,000
Lead	25,000
Iron (screen)	54,500,000

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Alaskan Copper Works
Date Received:	Not Applicable	Project:	% of acid, PO# M109207, F&BI 611339
Date Extracted:	12/05/06	Lab ID:	I6-434 mb
Date Analyzed:	12/05/06	Data File:	I6-434 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	btb

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	90	60	125
Indium	89	60	125
Holmium	90	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<1
Arsenic	<1
Silver	<1
Cadmium	<1
Lead	<1
Iron (screen)	<100



**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 12/11/06

Date Received: 11/30/06

Project: % of acid, PO# M109207, F&BI 611339

Date Analyzed: 12/04/06

**RESULTS FROM THE ANALYSIS OF PRODUCT SAMPLES  
FOR SPECIFIC GRAVITY  
@ 15.56 °C**

**Sample ID**

Laboratory ID

**Specific Gravity**

**M109207A Lg Tank**

611339-01

1.25

**M109207B Sm Tank**

611339-02

1.24



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/11/06

Date Received: 11/30/06

Project: % of acid, PO# M109207, F&BI 611339

Date Analyzed: 12/04/06

**RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES  
FOR PERCENT ACID**

Sample ID

Laboratory ID

Percent Acid

M109207A Lg Tank

611339-01

11

M109207B Sm Tank

611339-02

10

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

Date of Report: 12/11/06

Date Received: 11/30/06

Project: % of acid, PO# M109207, F&BI 611339

### QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS BY EPA METHOD 200.8

Laboratory Code: 611326-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	ug/L (ppb)	13.7	13.6	1	0-20
Nickel	ug/L (ppb)	4.49	4.25	5	0-20
Copper	ug/L (ppb)	258	243	6	0-20
Zinc	ug/L (ppb)	908	891	2	0-20
Arsenic	ug/L (ppb)	4.45	4.38	2	0-20
Silver	ug/L (ppb)	<1	<1	nm	0-20
Cadmium	ug/L (ppb)	<1	<1	nm	0-20
Lead	ug/L (ppb)	60.3	58.3	3	0-20

Laboratory Code: 611326-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	ug/L (ppb)	20	13.7	100 b	50-150
Nickel	ug/L (ppb)	20	4.49	100 b	50-150
Copper	ug/L (ppb)	20	258	47 b	50-150
Zinc	ug/L (ppb)	50	908	92 b	50-150
Arsenic	ug/L (ppb)	10	4.45	112 b	50-150
Silver	ug/L (ppb)	5	<1	75	50-150
Cadmium	ug/L (ppb)	5	<1	100	50-150
Lead	ug/L (ppb)	10	60.3	81 b	50-150

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 12/11/06

Date Received: 11/30/06

Project: % of acid, PO# M109207, F&BI 611339

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS BY EPA METHOD 200.8**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	96	70-130
Nickel	ug/L (ppb)	20	96	70-130
Copper	ug/L (ppb)	20	100	70-130
Zinc	ug/L (ppb)	50	116	70-130
Arsenic	ug/L (ppb)	10	96	70-130
Silver	ug/L (ppb)	5	60 vo	70-130
Cadmium	ug/L (ppb)	5	82	70-130
Lead	ug/L (ppb)	10	92	70-130

vo - The value reported fell outside the control limits established for this analyte.



**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 12/11/06

Date Received: 11/30/06

Project: % of acid, PO# M109207, F&BI 611339

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF PRODUCT SAMPLES  
FOR SPECIFIC GRAVITY  
@ 15.56 °C**

Laboratory Code: 611339-01 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Specific Gravity	1.25	1.25	0	0-2

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 12/11/06

Date Received: 11/30/06

Project: % of acid, PO# M109207, F&BI 611339

**QUALITY ASSURANCE RESULTS  
FROM THE ANALYSIS OF AQUEOUS SAMPLES  
FOR PERCENT ACID**

Laboratory Code: 611339-01 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Percent Acid	11	11	0	0-20



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

**RECEIVED**  
DEC 11 2006

December 5, 2006

Mike Erdahl  
Friedman & Bruya  
3012 - 16<sup>th</sup> Avenue West  
Seattle, WA 9819-2029

**RE: Project: 611339      PO# H-626**  
**ARI Job: KH12**

Dear Mike,

Please find enclosed the original chain of custody record and analytical results for the samples from the project referenced above. Analytical Resources, Inc. accepted sample volume in good condition on November 30, 2006.

The samples were analyzed for Fluoride, as requested.

There were no anomalies associated with these samples.

Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file electronically at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

Eric Branson  
Client Service Representative  
(206) 695-6213  
[eric@arilabs.com](mailto:eric@arilabs.com)  
[www.arilabs.com](http://www.arilabs.com)

Enclosures



KH12

AMB

## SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SAMPLERS (signature)

PROJECT NAME/NO.

611339

PO #

H-626

REMARKS

Please Fax Results

Page # 1 of 1

TURNAROUND TIME

☐ Standard (2 Weeks)☒ RUSH 11/1/06 ASAP

Rush charges authorized by:

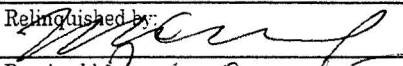
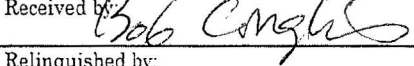
ME

SAMPLE DISPOSAL

☐ Dispose after 30 days☐ Return samples☐ Will call with instructions

						ANALYSES REQUESTED												Notes
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	O&G w/o SG	O&G w/sg	Total Hg	Dissolved Hg	EPH	VPH	Nitrate	Sulfate	Fluoride				
M109207A Lg Tank		11/30/06	11:30	HNO <sub>3</sub>	1										X			
M109207B Sm Tank		↓	↓	↓	1										X			

Friedman & Bruya, Inc.  
3012 16th Avenue West  
Seattle, WA 98119-2029  
Ph. (206) 285-8282  
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Michael Erdahl	Friedman & Bruya	11/30/06	1:30
Received by: 	Bob Congle	AR+	11/30/06	1600
Relinquished by:				
Received by:				

SAMPLE RESULTS-CONVENTIONALS  
KH12-Friedman & Bruya



Matrix: Liquid  
Data Release Authorized: *[Signature]*  
Reported: 12/05/06

Project: PO# H-626  
Event: 611339  
Date Sampled: 11/30/06  
Date Received: 11/30/06

Client ID: M109207A LG TANK  
ARI ID: 06-24035 KH12A

Analyte	Date Batch	Method	Units	RL	Sample
Fluoride	12/01/06 120106#1	EPA 300.0	mg/L	2,000	68,100

RL Analytical reporting limit  
U Undetected at reported detection limit

Water Sample Report-KH12

SAMPLE RESULTS-CONVENTIONALS  
KH12-Friedman & Bruya



Matrix: Liquid  
Data Release Authorized:  
Reported: 12/05/06

A handwritten signature, possibly 'M. O.', in black ink.

Project: PO# H-626  
Event: 611339  
Date Sampled: 11/30/06  
Date Received: 11/30/06

Client ID: M109207B SM TANK  
ARI ID: 06-24036 KH12B

Analyte	Date Batch	Method	Units	RL	Sample
Fluoride	12/04/06 120406#1	EPA 300.0	mg/L	1,000	49,500

RL Analytical reporting limit  
U Undetected at reported detection limit



METHOD BLANK RESULTS-CONVENTIONALS  
KH12-Friedman & Bruya



Matrix: Liquid  
Data Release Authorized  
Reported: 12/05/06

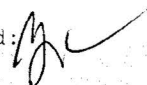
Project: PO# H-626  
Event: 611339  
Date Sampled: NA  
Date Received: NA

Analyte	Method	Date	Units	Blank
Fluoride	EPA 300.0	12/01/06	mg/L	< 0.1 U
		12/04/06		< 0.1 U

Water Method Blank Report-KH12

MS/MSD RESULTS-CONVENTIONALS  
KH12-Friedman & Bruya



Matrix: Liquid  
Data Release Authorized:   
Reported: 12/05/06

Project: PO# H-626  
Event: 611339  
Date Sampled: 11/30/06  
Date Received: 11/30/06

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: KH12A Client ID: M109207A LG TANK							
Fluoride	EPA 300.0	12/01/06	mg/L	68,100	110,000	40,000	104.8%

Water MS/MSD Report-KH12

AKC-0007214

REPLICATE RESULTS-CONVENTIONALS  
KH12-Friedman & Bruya



Matrix: Liquid  
Data Release Authorized  
Reported: 12/05/06

A handwritten signature in black ink, appearing to be 'JW' or similar, written over the 'Data Release Authorized' text.

Project: PO# H-626  
Event: 611339  
Date Sampled: 11/30/06  
Date Received: 11/30/06

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
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ARI ID: KH12A    Client ID: M109207A LG TANK

Fluoride	EPA 300.0	12/01/06	mg/L	68,100	68,100	0.0%
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Water Replicate Report-KH12



STANDARD REFERENCE RESULTS-CONVENTIONALS  
KH12-Friedman & Bruya



Matrix: Liquid  
Data Release Authorized: *[Signature]*  
Reported: 12/05/06

Project: PO# H-626  
Event: 611339  
Date Sampled: NA  
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Fluoride	EPA 300.0	12/01/06	mg/L	2.9	3.0	96.7%
ERA #		12/04/06		2.9	3.0	96.7%

Water Standard Reference Report-KH12

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Charlene Morrow, M.S.  
Yelena Aravkina, M.S.  
Bradley T. Benson, B.S.  
Kurt Johnson, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
TEL: (206) 285-8282  
FAX: (206) 283-5044  
e-mail: fbi@isomedia.com

December 11, 2006

Gerry Thompson, Project Manager  
Alaskan Copper Works  
628 South Hanford  
Seattle, WA 98134

Dear Mr. Thompson:

Included are the results from the testing of material submitted on November 30, 2006 from the % of acid, PO# M109207, F&BI 611339 project. There are 9 pages included in this report. The samples were sent to Analytical Resources, Inc. for fluoride analysis. Review of the enclosed report indicates that all quality assurance was acceptable.

Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
ACU1211R.DOC

## SAMPLE CHAIN OF CUSTODY

ME 11/30/06

AI4

Send Report To

Gerald Thompson

Company

Alaskan Copper Works

Address

6285 Howard St

City, State, ZIP

Seattle WA 98134

Phone #

328-8379

Fax #

382-4369

SAMPLERS (signature)

PROJECT NAME/NO.

% of Acid

PO #

M109207

REMARKS

Fax Results

Page # of

TURNAROUND TIME

☐ Standard (2 Weeks)☒ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days☐ Return samples☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED											Notes	
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	% of Acid 5G.	As, Pb, Cu	Fe, Pb, Mn	Ag, Zn	Flammable		
M109207A	01	11/30	11:30	HNO3	1								X	X	X	X	X	
LG Tank																		
M109207B	02	11/30	11:30	HNO3	1								X	X	X	X	X	
Sm Tank																		

Friedman & Bruya, Inc.  
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE

Relinquished by:

Received by:

Relinquished by:

Received by:

PRINT NAME

G. Thompson

Michelle Erdahl

COMPANY

ACW

FEBI

DATE

11/30

1

TIME

12:30

1

Samples received at 28 °C